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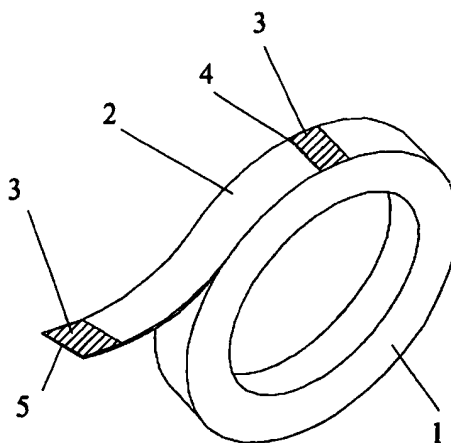
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(54) Title: ADHESIVE TAPE COILED INTO A ROLL-



(57) Abstract: The invention relates to a continuous adhesive tape coiled into a roll, characterized in that it consists of an alternate succession of portions (2) which are attached by their lower intrados adhesive-coated side, with a certain adhesion strenght but in a detachable manner, to the outer extrados side of the underlying turn of the coiled tape, and of detached or easily detachable portions (3), whereat the adhesion strenght of the lower intrados side of the tape against the upper extrados side of the underlying turn of the coiled tape is null or considerably reduced. The detached or easily detachable portions (3) may be obtained by annulling or reducing the adhesive action of the adhesive, e.g. by omitting the application or by reducing the amount and/or the application area thereof, or by completely or partly removing, covering or inactivating e.g. through drying and crystallization steps, the adhesive already applied on the lower intrados side of the tape and/or by making the upper extrados side of the tape wholly or partly adherent.

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-Adhesive tape coiled into a roll-

INTRODUCTION

5 The invention relates to continuous adhesive tapes coiled into rolls, whose lower intrados adhesive-coated side adheres with a certain adhesion strength but in a detachable manner against the upper extrados side of the underlying turn of the coiled tape.

10 The difficulty is known of finding and peeling the leading end of such an adhesive tape when, after peeling, unwinding and separating a portion of the tape from the roll, said end sticks onto the roll again. In order to obviate this difficulty, each time, the free
15 leading end of the adhesive tape has to be folded on itself, or a lift-tab of nonadhesive material, e.g. paper, has to be attached to said end, requiring an inconvenient and troublesome operation, which is not always possible. Various types of dispensers for
20 adhesive tapes coiled into rolls are also known, which are provided with a tape cutting edge and in which, after each cut, the free leading end of the tape remains attached in a detachable manner to a specially designed surface in a position wherein it can be easily
25 grasped. These dispensers are rather costly and their cutting means, when they are effective, may easily wound the user.

 The present invention has the object to obviate these and other drawbacks in an effective though simple
30 and cost-effective manner.

The object is achieved by the invention thanks to a continuous adhesive tape coiled into a roll, and substantially characterized in that it consists of an alternate succession of portions which are attached by
5 their lower intrados adhesive-coated side with a certain adhesion strength but in a detachable manner, against the outer extrados side of the underlying turn of the coiled tape, and of detached or easily detachable portions, whereat the adhesion strength of
10 the lower intrados side of the tape against the upper extrados side of the underlying turn of the coiled tape is null or considerably reduced. Therefore, according to the invention, after unwinding an adhesive tape strip, consisting of one or more attached portions,
15 from the roll, and after separating said strip from the remaining adhesive tape of the roll at the leading end of the next detached or easily detachable portion or at an intermediate position thereof, the leading end of the adhesive tape which is still coiled onto the roll
20 is always automatically formed by a portion which is detached or easily detachable from the upper extrados side of the underlying coiled tape and allows to easily lift and grasp the leading end of the remaining adhesive tape to unwind it from the coil.

25 In accordance with an additional characteristic of the invention, in order to easily find the leading end of the adhesive tape on the roll, said attached portions and/or detached or easily detachable portions are provided with identification marks, which allow to
30 distinguish them from each other and may also consist

of a particular color of at least one of the two types of portions.

As a rule, the detached or easily detachable portions of the coiled adhesive tape of the invention
5 are considerably shorter than the attached portions. Nevertheless, the invention does not exclude the possibility to provide, for special purposes, adhesive tapes wherein the attached portions are shorter than
10 the attached portions and the detached or easily detachable portions are substantially of the same length.

In order to easily peel an adhesive tape strip comprising one or more attached portions, joined
15 together by detached or easily detachable portions, from the roll, according to an additional characteristic of the invention, between the rear end (as viewed facing in the tape unwinding direction) of each attached portion and the next detached or easily
20 detachable portion and/or in at least one intermediate position of each detached or easily detachable portion and/or possibly between the rear end (still as viewed facing in the tape unwinding direction) of each
25 detached or easily detachable portion and the next attached portion, cross-web lines with predetermined and facilitated break strength are provided which may have any profile, for instance a straight, wavy, V-shaped or other profile and may be obtained in any
30 manner, e.g. by die cutting, half-cutting, embossing, punching, notching, or the like.

The lines with predetermined and facilitated break strength appropriately have such a resistance as to allow that a strip comprising one or more attached portions joined together may be unwound and separated
5 from the roll, while allowing the user to easily separate the individual attached portions from each other and/or from the detached or easily detachable portions.

The adhesion of the lower intrados portion of the
10 adhesive tape against the upper extrados side of the underlying turn of the coiled tape at the detached or easily detachable portions may be inhibited or reduced in any manner and by any means for annulling or weakening the adhesive action of the adhesive coating
15 the lower intrados side. To this end, the invention provides, for instance, the following possibilities which may be used individually or together in any combination:

- omitting to apply adhesive at the detached or
20 easily detachable portions of the tape or applying, at said portions, a smaller amount of adhesive and/or applying adhesive at these portions only over a zone of the corresponding tape surface, e.g. over one or more limited zones, of any shape or pattern,

- 25 - after applying adhesive evenly over the whole surface, covering the adhesive wholly or partly at said portions with nonadhesive covering materials, e.g. by printing processes, or wholly or partly removing the adhesive at the detached or easily detachable portions,
30 or applying strips or labels of nonadhesive covering

material, e.g. paper or plastic.

- after evenly coating the whole surface of the tape with adhesive, applying a powdered material at the detached or easily detachable portions, e.g. directly
5 or indirectly by an electrostatic process, by jet application or else, and/or catalyzing, crystallizing or drying wholly or partly at said portions by any process or means fit for the purpose,

- making the upper extrados side of the tape, at
10 the detached or easily detachable portions wholly or partly adhesive repellent at least with respect to the adhesive of the lower intrados side by application of an adhesive-repellent substance thereon, e.g. wax, silicone or the like and/or by a corresponding physical
15 and/or chemical and/or mechanical treatment of said upper extrados side, e.g. a laser or electromagnetic beam treatment, a corona discharge, heat treatments, or else. When this arrangement is implemented alone, it has the advantage that the tape has an uninterrupted
20 adhesiveness, as the lower intrados side may be evenly coated with adhesive all over its length, while achieving all the advantages determined, according to the invention, by the alternation of tape portions attached to the underlying turn of the coiled tape and
25 tape portions detached or easily detachable from said turn.

Further characteristics of the invention are included in the other dependent claims.

DESCRIPTION

30 An embodiment of an adhesive tape according to the

invention is shown in the schematic and perspective view of Figure 1 of the annexed drawing and will be described hereafter without limitation.

The illustrated adhesive tape is coiled into a roll 1 and has an alternate succession of portions 2, whereat its lower intrados adhesive-coated side, is attached with a certain adhesion strength, though in a removable manner, against the upper extrados side of the underlying turn of the coiled tape, and of portions 3, as shown in dashed lines, whereat the lower intrados side of the tape is detached or easily detachable from the upper extrados side of the underlying turn of the coiled tape. To this end, in the illustrated embodiment, at said portions 3, the adhesive wherewith the lower intrados side of the tape is coated, is omitted, removed, covered or rendered inactive. Hence, the tape is composed of adhesive portions 2 alternated to nonadhesive portions 3.

The nonadhesive portions 3 preferably have a different color from the adhesive portions 2 or are otherwise arranged to be recognizable by any mark. At least one cross-web line 4 with predetermined and facilitated break strength of the tape is provided between the rear end of each adhesive portion 2 (as viewed facing in the tape unwinding direction from the roll 1) and the next nonadhesive portion 3. The leading end 5 of the coiled tape consists of a nonadhesive portion 3 which may also be separated from the next first adhesive portion 2 by means of at least one line with predetermined and facilitated break strength.

The user unwinds from the roll 1 a tape strip comprising one or more adhesive portions 2 joined together by nonadhesive portions 3 and peels this strip from the remaining tape of the roll 1 at the line 4 with predetermined and facilitated break strength. The leading end of the tape which remains on the coil 1 is still a nonadhesive portion 3, detached from the underlying turn of the coiled tape and forming a tab which helps to find, grasp and lift the end of the tape to unwind it from the roll 1. The tape strip peeled off the roll 1 also has a tab at one of its ends, which is formed by a corresponding nonadhesive portion 3 and is very useful to handle the separated adhesive tape strip and to peel and remove it, after its use, from the object whereon it is applied. Hence, for example, in the case of adhesive tapes used to attach drawings on drawing tables, said nonadhesive end 3, which is integral with an end of the adhesive tape strip separated from the roll 1, is highly useful to detach the strip from the drawing to remove, displace or stretch the drawing.

The nonadhesive portions 3 and the adhesive portions 2 may be of any length. So, for instance, the adhesive portions 2 may have each a length of about 5 cm, whereas the nonadhesive portions 3 may have each a length of about 0.5 cm. When the user needs an adhesive tape portion longer than 5 cm, he will simply unwind and separate from the roll a strip comprising two or more adhesive portions 2, joined together by interposed nonadhesive portions 3. The short nonadhesive portions

3 included in this strip between the adhesive portions
2 do not affect considerably the action of said strip,
and even have an advantageous effect thereon, as they
provide adhesiveness discontinuity, which has the
5 effect of limiting any adhesion unevenness and
compensating for the stresses of the material.

In accordance with an embodiment which is not
shown but may be easily imagined, the adhesive portions
2 and the nonadhesive portions 3 of the tape of the
10 invention substantially have the same length,
preferably relatively small, whereby an adhesive tape
is obtained which exerts a sew-like action.

According to another embodiment of the invention,
the portions 2 form self-adhesive labels, whereas the
15 nonadhesive portions 3 form non self-adhesive labels.
The nonadhesive portions 3 may be arranged to be only
slightly or partly adhesive or easily detachable, for
instance figure 2 shows one of the methods disclosed in
the introduction, description and claims hereof, and
20 may thereby form substantially nonadhesive labels, for
instance by the application of a strip of adhesive on
one edge, to be attached in a non permanent and easily
detachable way.

Obviously, the adhesive tape of the invention may
25 have any length and be made of any material, e.g.
plastic, transparent or not, or paper, textile material
and others.

In accordance with a further characteristic, the
easily detachable portions of the tape are obtained by
30 means of the so-called half-cuts, i.e. indentations

through partial portions of the tape thickness along a predetermined break or tear-off line for separating individual easily detachable portions.

Regarding the provision of lines for separating easily detachable portions from the roll and the zones in which the tape extrados is partly or fully adhesive-repellent, it was observed that the position staggering between said zones due to the progressive increase of the winding radius remains within tolerances of one to a few millimeters for standard tape lengths (about 10 meters), i.e. definitely below the extension of the adhesive-repellent zones. However, in the process of coiling the tape with the back having adhesive-repellent (waxed) sections, the desired pitch is to be considered as a function of the start diameter of the roll: if the roll has a diameter D and the pitch of the segment, defined by the cut-off line is P , in order that the non-inhibited part overlaps the cutoff line, the staggered length shall be equal to the decimal part of the D/P ratio and, when the tape is very thick and/or long, the diameter of the dinking die may be appropriately increased to compensate for the staggering due to the thickness of the tape.

A further characteristic of the invention provides that a film having transverse fibers, with respect to the longitudinal extension of the tape, is used as a tape. This allows to tear the tape portions off the remaining coiled tape part along precise transverse lines, which do not tend to deviate in an uncontrolled manner in the tape longitudinal direction.

The process for manufacturing the adhesive tape of the invention may be obtained, for instance, by using the most inexpensive of the state of the art methods, which includes, as is known, the steps of coating the whole tape web and of rereeling and cutting it to a smaller size by a special machine; this machine may be complemented with modules which, in this step, may perform all the operations provided herein, such as cutoff lines, tape printing, adhesive inhibition, physical/chemical processes as set out in the descriptions and claims hereof.

The invention is not limited to the embodiments illustrated and described herein, but may be greatly varied and modified, especially in the range of equivalents, without departure from the guiding principle disclosed above and claimed below.

ADVANTAGES

The invention provides a number of advantages. Thanks to the tape of the invention, there is no need to fold the free leading end of the adhesive tape on itself, or to attach a lift-tab of nonadhesive material, e.g. paper, to said end, whereby an inconvenient and troublesome operation, which is not always possible, is avoided.

The economic and operational problems of well-known dispensers, as well as the dangerousness thereof, are also obviated.

The invention, besides allowing a highly convenient and economic implementation, which does not require substantial changes of current adhesive tape

manufacturing processes, provides a considerable convenience of use for the user. After unwinding an adhesive tape strip, consisting of one or more attached portions, from the roll, and after separating said
5 strip from the remaining adhesive tape of the roll at the leading end of the next detached or easily detachable portion or at an intermediate position thereof, the leading end of the adhesive tape which is still coiled onto the roll is always automatically
10 formed by a portion which is detached or easily detachable from the upper extrados side of the underlying coiled tape and allows to easily lift and grasp the leading end of the remaining adhesive tape to unwind it from the coil.

15 The lines with predetermined and facilitated break strength appropriately have such a resistance as to allow that a strip comprising one or more attached portions joined together may be unwound and separated from the roll, while allowing the user to easily
20 separate the individual attached portions from each other and/or from the detached or easily detachable portions.

Thanks to the physical/chemical treatment of the adhesive coating, for the provision of adhesive-
25 repellent zones, the advantage is obtained that the tape has an uninterrupted adhesiveness, since the tape lower intrados side may be evenly coated with adhesive all over its length, while achieving all the advantages determined, according to the invention, by the
30 alternation of tape portions attached to the underlying

turn of the coiled tape and tape portions detached or easily detachable from said turn.

CLAIMS

1. A continuous adhesive tape coiled into a roll, characterized in that it consists of an alternate succession of portions (2) which are attached by their
5 lower intrados adhesive-coated side, with a certain adhesion strength but in a detachable manner, to the outer extrados side of the underlying turn of the coiled tape, and of detached or easily detachable portions (3), whereat the adhesion strength at the
10 lower intrados side of the tape against the upper extrados side of the underlying turn of the coiled tape is null or considerably reduced.

2. An adhesive tape as claimed in claim 1, characterized in that the adhesion of the lower
15 intrados side of the adhesive tape against the upper extrados side of the underlying turn of the coiled tape at the detached or easily detachable portions is inhibited or reduced by annulling or weakening in any manner and by any means the adhesive action of the
20 adhesive coating the lower intrados side.

3. An adhesive tape as claimed in claim 4, characterized in that the adhesion at the detached or easily detachable portions is inhibited or reduced by wholly or partly covering the adhesive applied onto the
25 lower side of the tape with a nonadhesive material or substance, applied with any process whatever.

4. An adhesive tape as claimed in claim 5, characterized in that the nonadhesive covering material is ink or a mixture and is applied, for instance by
30 printing processes.

5. An adhesive tape as claimed in claim 5, characterized in that the nonadhesive covering substance is in powder form and is applied for instance directly or indirectly by an electrostatic process.

5 6. An adhesive tape as claimed in claim 4, characterized in that the adhesive action of the adhesive at the detached or easily detachable portions is annulled or reduced by wholly or partially drying or crystallizing, with any processes, the adhesive applied
10 on the inner side of the tape.

7. An adhesive tape as claimed in claim 1 or one or more of claims 2 to 10, characterized in that the adhesion of the lower intrados side against the upper extrados side of the underlying turn of the coiled tape
15 at the detached or easily detachable portions is inhibited or reduced wholly or partly by rendering said upper extrados side of the tape at least wholly or partly adhesive-repellent, by any processes and means and at least with respect to the adhesive applied on
20 the lower intrados side of the tape.

8. An adhesive layer as claimed in claim 11, characterized in that the outer extrados side of the tape is rendered wholly or partly adhesive-repellent at the detached or easily detachable portions, by wholly
25 or partly coating said side with an adhesive-repellent material or substance, applied with any process.

9. An adhesive tape as claimed in claim 8, characterized in that the adhesive-repellent material is a wax and is applied, for instance by means of
30 printing processes.

10. An adhesive tape as claimed in claim 11, characterized in that, at the detached or easily detachable portions, the outer extrados side of the tape is rendered wholly or partly adhesive-repellent by
5 means of chemical and/or physical and/or mechanical treatments, e.g. by laser beams, electromagnetic beams, corona discharge, heat treatments, catalysts, or others.

11. An adhesive tape as claimed in one or more of
10 the preceding claims, characterized in that at least one line with predetermined and facilitated break strength is provided in the detached or easily detachable portion, preferably at the beginning of the portion in the roll unwinding direction, but without
15 excluding other intermediate and/or opposite end positions.

12. An adhesive tape as claimed in one or more of the preceding claims, characterized in that the lines with predetermined and facilitated break strength in
20 the tape keep such a resistance as to allow winding and unwinding from the roll of a continuous strip comprising two or more attached portions, joined together by detached or easily detachable portions, but in such a manner as to subsequently allow an easy
25 separation between the individual portions of the peeled off strip.

13. An adhesive tape as claimed in one or more of the preceding claims, characterized in that the lines with predetermined and facilitated break strength may
30 have any profile, particularly a straight, wavy, V-

shaped, arrow-shaped profile directed towards the tape unwinding direction, and the like.

14. An adhesive tape as claimed in one or more of the preceding claims, characterized in that the lines
5 with predetermined and facilitated break strength are obtained by any process and means, e.g. by die cutting, half-cutting, embossing, punching, notching, and the like or generally with methods which allow the break to start on the edge of the tape.

10 15. An adhesive tape as claimed in one or more of the preceding claims, characterized in that the ratio of the detached or easily detachable portions to the attached portions may be included in a range from a value in which it is maximized through intermediate
15 values to an opposite value in which it is minimized.

16. An adhesive tape as claimed in one or more of the preceding claims, characterized in that the attached portions and/or the detached or easily detachable portions are provided with identification
20 marks, which allow to distinguish them from each other and may even simply consist of a particular color.

17. An adhesive tape as claimed in one or more of the preceding claims, characterized in that the attached portions form normally self-adhesive labels,
25 whereas the detached or easily detachable portions may form non self-adhesive labels or slightly or temporarily self-adhesive labels.

18. An adhesive tape as claimed in one or more of the preceding claims, characterized in that the non
30 self-adhesive portions form labels having a self-

adhesive or slightly or temporarily self-adhesive zone,
for instance with the adhesive portion limited to an
edge.

19. An adhesive tape as claimed in one or more of
5 the preceding claims, characterized in that the tape is
printed inside its portions, thereby forming labels.

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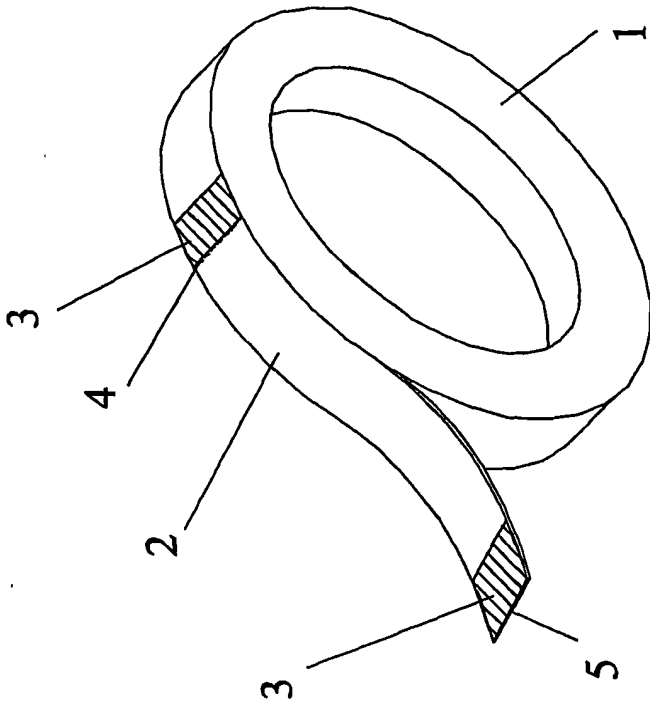


Fig. 1

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 02/00100

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C09J7/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C09J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 422 364 A (SHU LIEN LIOU) 28 January 1976 (1976-01-28) claims 1-5 page 2, line 35 - line 44 figures 1,2	1-3, 11-19
X	DE 29 09 276 A (COHAUSZ HELGE B) 18 September 1980 (1980-09-18) claims; figures page 6, paragraph 4	1-3, 11-19
P, X	WO 01 14488 A (3M INNOVATIVE PROPERTIES CO) 1 March 2001 (2001-03-01) claims 1,2,4,5,7,11 page 4, line 18 - line 27 page 7, line 7 - line 24 page 8, line 6 - line 10 figures 1,2A	1-10
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
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- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 02/00100

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 02/00100

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